

# S'COOL BREEZE



Student's Cloud Observations On-Line

Volume 2 , Issue 6

June 2002

## Up, Up and Around with Aqua

By Jack Cooper, CERES Project Manager



Ten, nine, eight, seven...as the final seconds in the launch countdown blare from the PA system in the launch viewing area, my heart is pounding with excitement and trepidation. Images of the last ten years flash across my mind. Issues discussed during design, problems during instrument build and test, glitches during integration and testing on the spacecraft. Six, five, four; the count continues. I'm thinking, did we do everything we could have to check the instruments out in preparation for flight. If not, it's too late now! Three, two, one, ignition, lift off! A loud cheer goes up from the crowd. My chest is still pounding with excitement as the Aqua spacecraft with two of our CERES instruments on-board begins its journey towards the sky.

The launch countdown went perfectly without a delay. The launch occurred in the wee hours of the morning on Saturday, May 4<sup>th</sup> at 2:55 a.m. PDT, from Vandenberg Air Force Base, CA. The weather prediction had been for ground fog at launch time, but only a low stratus cloud deck showed up, so we were

(Continued on page 2)



Aqua Launches  
May 4, 2002!

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## S'COOL Observers "Extraordinaire"

As many of our school observers finish their school year, we like to recognize our TOP observers. Our database of ground truth observations has grown to over 15,000 observations!

### This Year's Top 25 Observing Schools are:

1. Jewett Street School, Manchester, NH
2. Chartiers-Houston Jr./Sr. High School, Houston, PA
3. Daniel Boone Middle School, Birdsboro, PA
4. Harding Middle School, Cedar Rapids, IA
5. Ecole Jean Jaures, Le Versoud, France
6. Waynesboro Area High School, Waynesboro, PA
7. Winfield Elementary School, Cabot, PA
8. Sissonville Elementary School, Sissonville, WV
9. Burlington County Institute of Technology, Medford, NJ
10. St. James School, Falls Church, VA
11. Francisco Zayas Santana, Villalba, PR
12. American International School of Budapest, Budapest, Hungary

13. Charles Upson Elementary School, Lockport, NY
14. Parrott Middle School, Brooksville, FL
15. College Les Tamarins, Ile de La Reunion, France
16. Picture Rocks Intermediate, Tucson, AZ
17. Rockcastle County Middle School, Mt. Vernon, KY
18. Wan-Fang Middle School, Taipei, Taiwan
19. Fowler Middle School, Maynard, MA
20. Primaire Publique, Etrun, France
21. Waiiau Elementary School, Pearl City, HI
22. Ecole Communales, Martigny, Valais, Switzerland
23. Corrales Elementary Corrales, NM
24. Colegio La Salle, Paterna - Valencia, Spain
25. Columbia Middle School, Logansport, IN
- Tie: Taipei Municipal First Girls' Senior H.S., Taipei, Taiwan



Thank you to ALL our S'COOL Observers!

View the over 7,000 observations made this year at [http://scool.larc.nasa.gov/query\\_data.html](http://scool.larc.nasa.gov/query_data.html)



### Up, Up and Around *(continued from page 1)*

able to see the launch. It was spectacular!! At ignition, the cloud layer lit up for miles with a gold-colored glow. Within a few seconds, it disappeared into the low level clouds. A few seconds later the sound blast hit us; it was a perfect launch! The mission launched on time (to the second) and to within 1km of the target insertion orbit altitude of 680 km. Over the next several weeks, using several spacecraft thruster orbit adjust burns, Aqua will be moved to its mission orbit of 705 km. This was about the largest payload (i.e. spacecraft weight of 3022 kg) that a Delta II can launch, with nine strap on solid rockets helping the main liquid engine.



**Aqua Pre-launch:**  
Ready for take off !

<http://eos-pm.gsfc.nasa.gov>

after launch they were rotated up 90 to their mission operational position. Subsequently, all the instruments have been powered on and are currently undergoing checkout over the next several weeks before starting routine mission operations. There is an outgassing period of about a month before we open the contamination covers on CERES and provide the first Earth scans. Meanwhile the instrument team will be checking that the views of the internal calibration sources and instrument operations are nominal.

As the excitement of the launch fades, new emotions begin to stir within me in anticipation of opening the instrument contamination covers to begin the CERES/Aqua Science mission. Up to now, everything has been in preparation for the real objective—that is, to provide the CERES Science team with flight data to investigate the impact of clouds on the heating

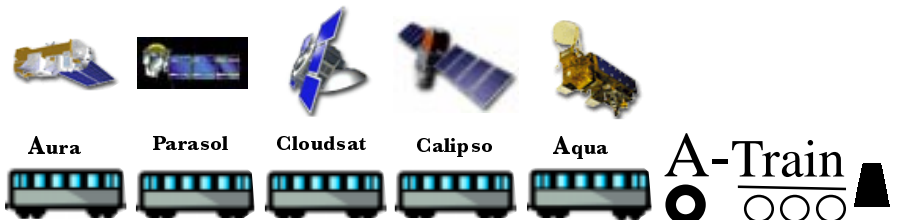
and cooling of our planet—a critical element in helping understand the causes of climate change. Then, the project/instrument teams job will be done. It has been a great experience and a lot of fun. It has been a great experience and a lot of fun, with contributions from many people - including S'COOL participants! •



“ At ignition, the cloud layer lit up for miles with a gold-colored glow. Within a few seconds, it disappeared into the low level clouds. A few seconds later the sound blast hit us; **it was a perfect launch! .”**

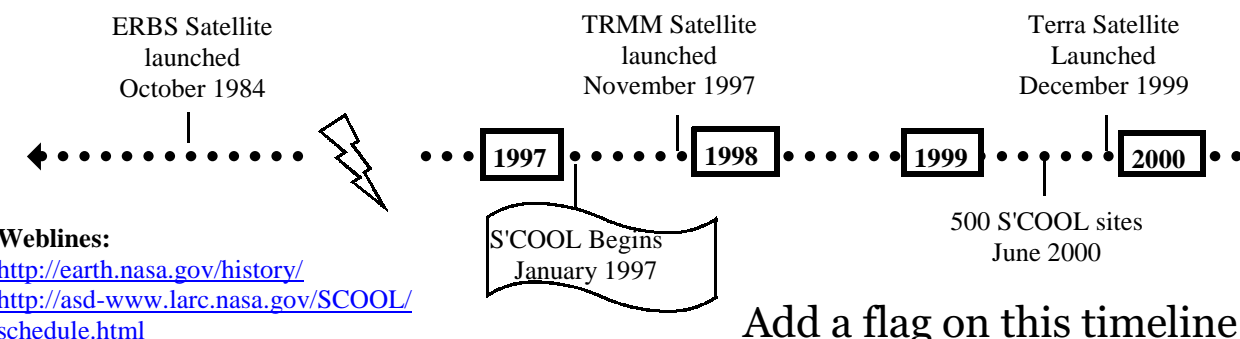
There are two CERES instruments of the total seven instruments on Aqua. So far, everything is nominal. Both CERES instruments are also successfully deployed. To get our unobstructed view of the entire earth hemisphere for angular models, our CERES instruments are higher than the other instruments on the spacecraft and would not fit inside the rocket fairing. Therefore, CERES instruments were laid on their side during launch and about eight hours

Aqua leads a "train" of Earth observing spacecraft to be launched over the next 15 year.



[http://aqua.nasa.gov/formation\\_flying.html](http://aqua.nasa.gov/formation_flying.html)

## S'COOL TIMELINE: *A Quinquennium*



Add a flag on this timeline

## Satellite Circles



One of the characteristics the TRMM, Terra and Aqua spacecrafts have in common is they all carry the CERES instrument collecting data as a part of the NASA Earth's Observing System (EOS).

<http://earthobservatory.nasa.gov/MissionControl/>

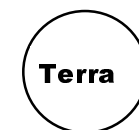
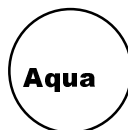
[http://gaia.hq.nasa.gov/ese\\_missions/lau\\_select.cfm](http://gaia.hq.nasa.gov/ese_missions/lau_select.cfm)

- Have one group of students make a list of all the characteristics of the Aqua Satellite in a circle.

**Aqua Resources:**

<http://eos-pm.gsfc.nasa.gov/>

[http://eosps0.gsfc.nasa.gov/ftp\\_docs/Aqua\\_FactSheet.pdf](http://eosps0.gsfc.nasa.gov/ftp_docs/Aqua_FactSheet.pdf)

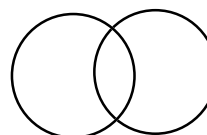


- Have another group of students make a list of all the characteristics of the Terra Satellite in another circle.

**Terra Resources:**

<http://terra.nasa.gov/>

<http://eos-am.gsfc.nasa.gov/>



### How are these satellites similar and different?

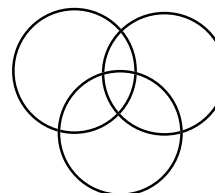
- Make Venn Diagram to compare the satellites carrying the CERES Instrument. Each satellites unique characteristics should stay in their own circle and their similar characteristics should be in the intersecting portion of the circles.

- Try adding a third circle for the TRMM satellite for a challenge.

**TRMM Resource:**

<http://trmm.gsfc.nasa.gov/>

- Have the students use their Venn Diagram to write a paper comparing the EOS satellites.



Although it will be tough leaving the S'COOL Team here, I look forward to the opportunity to be a **S'COOL teacher** and have my students make cloud observations from the field with the "best" of you.



### Back to School! : This Fall the S'COOL Teacher-in-Residence will return to school (notice the h).

I have decided to return to the classroom for two years. My family and I will be moving to Kiev, Ukraine this summer where I will be teaching 5th grade at New Hope School. Although it will be tough leaving the S'COOL Team here, I look forward to the opportunity to be a S'COOL teacher and have my students make cloud observations from the field with the "best" of you. It has been a true pleasure to work with everyone related to S'COOL and I can't wait to use all the S'COOL resources with my class next year. My first question just might be, "Now, what is my password?" Ukraine will be the 60th country working with S'COOL! Looking UP! Doug



### Teacher Corner

All registered schools are welcome to observe when convenient with your teaching schedule. There is no need to re-register. Your observations are welcome anytime.

Let us know if your e-mail or postal address changes over the summer.

Over 1,110 sites are registered with S'COOL across the globe in 60 countries.

Please take a few minutes to provide us with feedback by completing the EDCATS Teacher survey on-line.



[http://ehb2.gsfc.nasa.gov/edcats/centers/scool\\_teacher\\_survey.html](http://ehb2.gsfc.nasa.gov/edcats/centers/scool_teacher_survey.html)

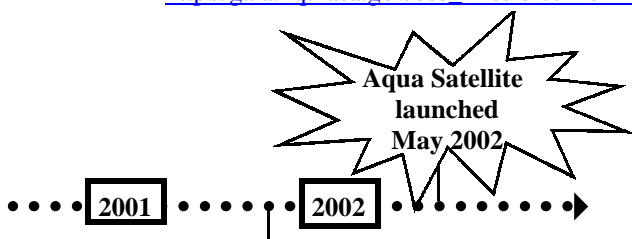
We value all teacher input, **please comment**.

Check out past Breeze Newsletters on-line

<http://asd-www.larc.nasa.gov/SCOOOL/breeze/>

**Thank you for your participation!**

[http://gaia.hq.nasa.gov/ese\\_mission/timeline.cfm](http://gaia.hq.nasa.gov/ese_mission/timeline.cfm)



1,000 S'COOL sites  
October 2001

when your school began observing!

NASA Langley Research Center  
ATT: S'COOL Project  
Mail Stop 927  
Hampton, VA 23681-2199



## **Upcoming Events**

*IOP July 15-19, 2002*

*Summer S'COOL Workshop,  
July 17-24, 2002  
NASA LaRC, Hampton, VA USA*

*27th CERES Science Team Meeting  
September 17-19, 2002  
Princeton, NJ USA*

*SACNAS K-12 Teacher Workshop  
September 26-29, 2002  
Anaheim, CA USA*

For more information contact us by:  
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Douglas Stoddard, editor

Dr. Lin Chambers, French Translator

Roberto Sepulveda, Spanish Translator

***"Our class had fun learning about clouds." David***

***"I think S'COOL is a blast!" Nathan "S'COOL is fun, exciting and educational."  
Lynn "S'COOL IS SO GREAT!" Brittany "You learn a lot about clouds and other  
stuff too!" Bruce "...yours students can do more like talk to NASA ,make  
observations on clouds, ... and it doesn't make the students bored." Joyce "My  
class' favorite time of the day is the sky observations." Parker "It has made us  
more proud of ourselves for having a chance to help NASA." Erik "If all of us use  
this cool S'COOL, there will be a lot of scientists in this world!" Eui Li***

Ms. McSheffrey's 5th Grade Class, Osan American Elementary School, Osan, Korea